DWR has the responsibility of managing the state's big game populations. Within the study area, big game is mostly limited to mule deer (Green 2007a). Mule deer utilize virtually all types of undeveloped habitat in Utah, including the undeveloped habitats within the SR-92 study area.

Historically, the adjacent foothills and benchlands south of Traverse Mountain and the Wasatch Mountains have provided critical winter range for hundreds of mule deer (Green 2007a). In recent years, urbanization has reduced the quantity and quality of winter range, resulting in a declining mule deer population. The study area west of Dry Creek is mostly undeveloped grassland that may provide some winter forage for mule deer. The study area east of Dry Creek is surrounded by residential and/or commercial development and does not have any migratory corridors connecting it to other patches of big game habitat. The lack of cover and connectivity with other habitat patches limits the availability of critical winter range east of Dry Creek.

According to DWR records, 22 to 92 road kills occurred annually between 2001 and 2005 along SR-92 between I-15 and SR-146 at the mouth of American Fork Canyon; see Table 3-35 for more detail (DWR 2007b). Road kills are anticipated to increase with growing rates of development and vehicular traffic in this area (Green 2007a).

Table 3-35: Mule Deer Road Kills Along the SR-92 Between I-15 and SR-146

Mile Point	2001	2002	2003	2004	2005	5-Year Total
1	9	5	13	9	3	39
2	7	11	12	27	3	60
3	3	9	4	23	3	42
4	4	2	4	15	5	30
5	2	1	3	5	3	14
6	3	5	4	9	5	26
7	1	2	N/A	4	N/A	7
Totals	**29**	**35**	**40**	**92**	**22**	**218**

Source: DWR 2007b

Urban wildlife includes those species adapted to urban landscapes and human habitation like rodents and songbirds. The study area east of Dry Creek is within the incorporated boundaries of Highland and is almost completely developed. Landscaping associated with residential and commercial developments may provide some habitat for urban wildlife.

Aquatic Wildlife

Dry Creek is listed by DWR as a Class VI intermittent stream channel and may support non-game fish or no fish at all. DWR biologists indicated that Dry Creek in the vicinity of the SR-92 study area could potentially support small populations of brown trout (Green 2007a and 2007b). The presence of brown trout populations would be highly dependent on the quality and quantity of flows, which can vary greatly during the spring and summer irrigation season. Additionally, the upstream irrigation diversions and the downstream flood control and debris basin are barriers to fish migration; these barriers inhibit the establishment of sustainable populations.

There are no known populations of sensitive invertebrate or amphibian species within the study area (Green 2007a and 2007b). Irrigation diversions, channel modifications, and lack of riparian cover downstream of the SR-92 road crossing limit the presence and quality of aquatic habitat for macro-invertebrates, amphibians, and other aquatic species.

The American Fork River below the diversion dam and weir facility at the mouth of the American Fork Canyon is listed by DWR as a Class VI stream that bears non-game fish. The American Fork River below the diversion dam does not support a trout fishery because of barriers to fish movement and seasonal flow reductions due to irrigation diversions. In addition, the straightening, armoring, and entrenchment of the river channel for the diversion dam, SR-92 road crossing, and flood control have modified and reduced the quality of in-stream habitat.

There are no known populations of sensitive invertebrate or amphibian species within the study area (Green 2007a and 2007b). Irrigation diversions and channel substrate modifications limit the presence and quality of aquatic habitat for macro-invertebrates, amphibians, and other aquatic species.

Federally Listed Threatened and Endangered Species

There are no known occurrences or observations of any of the listed threatened and endangered species within the study area, and the study area lacks suitable habitat for these species.

Utah Sensitive Species

According to DWR, there are no known occurrences or observations of any Utah sensitive species within the study area. However, there are recent records of occurrence for Townsend's big-eared bat and historical records of occurrence for the American white pelican, burrowing owl, greater sage-grouse, northern goshawk, and western yellow-billed cuckoo in the general vicinity of the study area (Lindsey 2007).

Impacts

No-Build Alternative

Direct Impacts

Under the No-Build Alternative, future growth and development would continue to occur in accordance with the cities' and Utah County's general plans as described in Section 3.1 of this EA. This would result in the conversion of undeveloped grassland, farmland, and other developable lands adjacent to the SR-92 right-of-way to residential housing, commercial developments, and related infrastructure.

Current development trends would likely result in the alteration of the grassland and farmland habitats in and adjacent to the study area. Only urban wildlife habitat and the habitats associated with the undevelopable floodplains, riparian hillslopes, and stream channels would remain.

Vehicle collisions with mule deer would likely occur at rates similar to those shown in Table 3-35, but may eventually decline in the future when the availability of critical winter range and habitat for mule deer no longer exists due to land development.

There would be no effect to federally listed threatened and endangered species or Utah sensitive species because of the following:

- There are no known occurrences of these species within the study area.
- The study area lacks suitable habitat for these species.

Indirect Impacts

The indirect impacts of the No-Build Alternative would likely be a slower rate of future development in and around the study area because there would be less traffic capacity. The potential of direct impacts to wildlife would be the same as described above but would likely occur at a slower rate.

Preferred Alternative

Direct Impacts

Construction of the proposed road improvements would result in the direct loss of farmland habitat, undeveloped grassland habitat, riparian and hillslope habitat associated with the Dry Creek and American Fork River stream corridors, in-stream habitat associated with the Dry Creek and American Fork stream channels, and habitat associated with man-made canals and ditches. A maximum total of approximately 199 acres of habitat potentially used by wildlife within the study area may be lost as a result of the Preferred Alternative; see Table 3-36 for more detail. This measurement assumes that the entire proposed right-of-way—including easements—would be impacted. It is likely that the actual impacts would be less than what is estimated in the table below.

Table 3-36: Acreage of Wildlife Habitats Potentially Directly Impacted by Preferred Alternative

Habitat	Approximate Impact Acreage
Irrigated Farmland and Pasture	5.2
Undeveloped Grassland Zoned for Commercial/Residential Development	188
Riparian and Hillslope Habitats Associated with Stream Corridors	1.5
Stream Channels	1.2
Man-Made Canals and Ditches	2.8
Total Acreage of Potential Wildlife Habitat Loss	**199**

Source: Frontier Corporation 2008

The loss of habitat depicted in Table 3-36 may decrease the presence of urban wildlife and migratory birds.

The proposed roadway improvements would increase travel capacity. The combination of higher travel speeds, a wider right-of-way, and traffic volumes may lead to higher rates of vehicle collisions with mule deer. Vehicle collisions with mule deer may eventually decline in the future when the availability of critical winter range and habitat for mule deer no longer exists due to maximum land development.

The existing SR-92 culvert at the American Fork River would be replaced with the implementation of the Preferred Alternative. Impacts to aquatic wildlife from this action are anticipated to be minimal because the existing in-stream habitat is of marginal quality. The spanning of the pedestrian bridge across the American Fork River channel would avoid direct impacts to aquatic wildlife. The existing box culvert at the Dry Creek crossing would remain in place, there would be no impact to in-stream habitat.

There would be no impacts to federally listed threatened and endangered species or Utah sensitive species because of the following:

- There are no known occurrences of these species within the study area.
- The study area lacks suitable habitat for these species.

Indirect Impacts

The Preferred Alternative is expected to have greater capacity to accommodate increased traffic volumes. In comparison to the No-Build Alternative, this will likely result in faster rates of development and therefore a loss of habitat potentially used by wildlife.

Mitigation

The MBTA regulations apply to construction activities in habitats that could be potentially occupied by migratory birds. Within the study area, potential habitat for migratory birds is mostly associated with the undeveloped riparian and hillslope areas along the Dry Creek and the American Fork River stream corridors. The habitat is also associated with the narrow bands of riparian trees and shrubs associated with certain canal and ditch sections. In these riparian areas, the following measures apply:

- Whenever practicable, construction activities for clearing and grubbing will be scheduled to avoid the nesting season of migratory birds, April 1 to August 31.
- If clearing and grubbing must occur during the nesting season, a qualified biologist will verify the absence of nesting birds before construction activities occur. If migratory birds are found nesting near the construction area, UDOT will cease construction within one-quarter mile of the nest until the migratory birds have fledged, or August 31.
- If clearing and grubbing begins prior to the nesting season, it will continue without prolonged breaks as a measure to avoid habitation by migratory birds until after the work is completed.
- If possible, the new Dry Creek box culvert will be constructed during the non-nesting season, which occurs September 1 to April 1 to avoid impacts to nesting cliff swallows in the existing box culvert. If construction begins prior to the nesting season, it will continue without prolonged breaks as a measure to avoid habitation by migratory birds until after the work is completed.

This project will not result in the taking of any migratory birds. Any potential taking of a migratory bird will be coordinated with the USFWS in accordance with the MBTA.

Improvements to the American Fork River road crossings will require a federal CWA Section 404 permit, a state stream alteration permit, and/or a county floodplain encroachment permit. Improvements to the Dry Creek road crossings will require a state stream alteration permit, and/or a county floodplain encroachment permit. Impacts to terrestrial and aquatic wildlife will be fully mitigated in accordance to the requirements that will be specified in these permits.

DWR wildlife biologists recommend the use of additional wildlife signage and lighting along SR-92 to inform motorists of the need to slow down and watch for migrating mule deer west of Dry Creek (Green 2007a).

3.14 INVASIVE SPECIES

Regulatory Setting

Invasive species have been assessed within the study area in accordance with EO 13112 Invasive Species, which requires federal agencies to combat the introduction or spread of invasive species, and the Utah Noxious Weed Act (Title 04, Chapter 17), which is designed to prevent and control noxious weeds.

Affected Environment

Through coordination with the Utah County weed coordinator, a list of invasive weeds that are located within the study area were identified; see Table 3-37 for more detail.

Table 3-37: List of Invasive Weed Species Located Within the SR-92 Study Area

Invasive Species	General Location Along SR-92 Corridor
Scotch Thistle *(Onopordum Acanthium)*	I-15 interchange to the west of Dry Creek
Yellow Starthistle *(Centaurea Solstitialis)*	West side of Dry Creek
Dyers Woad *(Isatis Tinctoria)*	West side of Dry Creek
Dalmatian Toadflax (Linaria Genistifolia)	East of Dry Creek in Highland
Musk Thistle (Cardus Nutans)	Near mouth of American Fork Canyon

Source: Searle 2007

Impacts

No-Build Alternative

No earthmoving or soil disturbance from the improvement of SR-92 would occur under the No-Build Alternative; therefore, no direct impacts to the presence or spreading of invasive species would be expected as a result of this alternative. However, earthmoving and soil disturbance associated with adjacent land use development would continue and, at current rates, could indirectly impact the presence and the spreading of invasive species within the SR-92 study area.

Preferred Alternative

Vegetation and soil disturbance due to project construction activities has the potential to create new sites for invasive weed establishment. Specifically, movement of construction equipment and personal vehicles into and away from disturbed construction sites has the potential to spread existing weed seed both into and out of the SR-92 study area.

Mitigation

In accordance with regulations for invasive species, the landscaping and erosion control activities associated with the project will not use species listed as noxious weeds and will be free of invasive weed seed and plant parts.

In addition, recommendations made by the Utah County weed coordinator will be considered during construction of the project. These recommendations include the following:

- Topsoil will remain at and be used on the job site to prevent transfer of invasive weed seed and plant parts outside of the SR-92 study area.

- Construction vehicles and machinery will be inspected and cleaned, as necessary, to prevent transfer of invasive weed seed and plant parts into and out of the SR-92 study area.

3.15 HISTORIC, ARCHAEOLOGICAL, AND PALEONTOLOGICAL RESOURCES

Regulatory Setting

The National Historic Preservation Act (NHPA) outlines the national policy and procedures regarding historic properties, meaning districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places (NRHP). Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on such properties by following regulations issued by the Advisory Council on Historic Preservation (ACHP)—36 CFR 800. Other federal legislation includes Section 4(f) of the Department of Transportation (DOT) Act of 1966—49 USC 303. See Chapter 4 for more detail.

Study Area

In accordance with NHPA's regulation, 36 CFR 800.4, the study area for cultural resources is defined as the area of potential effects (APE) for direct and indirect impacts. UDOT, in consultation with the Utah State Historic Preservation Office (SHPO), established the APE as a linear corridor that is variable in width; it extends east of I-15 to SR-146 and is centered on the existing roadway's centerline. The additional area around the SR-92 and SR-146 intersection, including two short corridors of identical width that intersect with SR-92, was also incorporated into the APE to allow for the intersection's possible realignment. This APE encompasses all areas that would be subject to ground disturbance. It also includes areas on which construction could directly affect or physically impact historic, archaeological, or paleontological resources or could indirectly affect these same resources through changes in their setting, feeling, association, or other integral elements of their character or importance.

Efforts to identify the historic, archaeological, and paleontological resources that could be affected by implementing the Preferred Alternative included a visual inspection of the APE, consultation with various entities, a review of past studies in the area, and an evaluation of records from the Utah Division of State History's Antiquities and Preservation sections.

The visual inspection of the APE was conducted through pedestrian and reconnaissance inventories as well as archival research. The detailed findings of this visual assessment are contained in a separate technical report (Nelson 2007). A summary of the findings is provided in this section of the EA.

The consultation component of the cultural resource study included written and verbal correspondence. Interested parties were consulted regarding the area's historic, archeological, and paleontological resources. These interested parties included representatives from local communities, certified local governments, and three Native American Tribes—the Northwestern Band of Shoshone Nation, the Shoshone-Bannock Tribes, and the Skull Valley Band of the Goshutes. A copy of the letter sent to the tribes is included in Appendix A. None of the contacted parties listed above identified any sites, areas, or resources of concern, and none requested to be included in the project as formal consulting parties. In addition to the above entities, UGS was consulted regarding paleontological resources; for more information, please see UGS correspondence found in Appendix C.

Impacts to cultural resources were assessed based on the standards of the NHPA and its implementing regulations found in 36 CFR 800. Under the regulations, the categories for classifying impacts to cultural resources were established to determine whether or not a resource is eligible for the NRHP. The three classifications include *no historic properties affected*, *no adverse effect*, and *adverse effect*. The classification of impacts to any given cultural resource is based upon two key factors: 1) whether or not the proposed undertaking would affect the resource at all; and 2) whether an impact would be neutral, minimally negative (i.e., not adverse) or substantially negative (i.e., adverse). After evaluating the design of the Preferred Alternative relative to the known NRHP-eligible resources in the area and consulting with interested parties affiliated with those resources, UDOT made determinations of effect for each of these resources within the APE. UDOT consulted with SHPO regarding the determinations, and SHPO concurred with UDOT's findings. This correspondence can be found in Appendix C.

Affected Environment

A cultural resource site or building may be considered eligible for NRHP inclusion if it meets the following criteria:

- It is associated with events that have made a significant contribution to the broad patterns of our history.
- It is associated with the lives of significant persons in our past.
- It embodies the distinctive characteristics of a type, period, or method of construction; it represents the work of a master or possesses high artistic values; or it represents a significant and distinguishable entity whose components may lack individual distinction.
- It yields, or may be likely to yield, information important in prehistory or history.

Archaeological Resources

Ten archaeological sites were identified within the SR-92 APE. These include six historic canals, one historic railroad corridor, the remains of one historic residential property, one historic debris scatter, and one prehistoric lithic scatter. Once identified, each archaeological site must be evaluated by the NRHP's criteria.

Archaeological resources considered potentially eligible under one of the four criteria must also be evaluated for integrity of location, design, setting, materials, workmanship, feeling, and association. The resources found within the SR-92 APE are listed in Table 3-38. The locations of the linear sites—for example, canals and railroads—are shown on Figure 3-17 in Section 3.9 of this document. The location of the prehistoric site is not provided because this information may compromise the security of the site. The NRHP eligibility determinations identified in Table 3-34 represent the final determinations made by UDOT and FHWA in consultation with SHPO.

Table 3-38: Archaeological Resources

Site Number	Site Name (If Applicable)	Site Type	NRHP Eligibility
42UT947	Provo Reservoir Canal (also known as Murdock Canal)	Historic Canal	Eligible
4UT964*	N/A	Prehistoric Lithic Scatter	Not Eligible
42UT973	Bull River Ditch	Historic Canal	Not Eligible
42UT974	Fox Ditch	Historic Canal	Not Eligible
42UT1029	Utah Southern/Union Pacific Railroad	Historic Railroad	Eligible
42UT1133	Pleasant Grove Ditch	Historic Canal	Eligible
42UT1317	N/A	Historic Residential Site	Not Eligible

Site Number	Site Name (If Applicable)	Site Type	NRHP Eligibility
42UT1547	American Fork Ditch (American Fork Canyon Ditch)	Historic Canal	Eligible
42UT1594*	N/A	Historic Debris Scatter	Not Eligible
42UT1605	Lehi Ditch (two branches crossing SR-92)	Historic Canal	Eligible
** Not shown on Figure 3-24.*			
Note: The historical names of some canals may not match their current names; this is a result of merging canal systems.			

Historical Buildings

Within the State of Utah, historic buildings are evaluated using a rating system established by SHPO. In addition, each site is evaluated based on the NRHP criteria listed in the previous section. The SHPO rating system allows one of four ratings to be assigned to buildings and structures based upon the degree to which they retain historical and architectural integrity. These ratings include the following:

- A-Rated Eligible: Built within the historic period and retains integrity. Excellent example of a style or type. Unaltered or only minor alterations or additions.
- B-Rated Eligible: Built within the historic period and retains integrity. Good example of a style or type but not as well-preserved or well-executed as A-rated buildings. Although overall integrity is retained, this structure has more substantial alterations or additions than A-rated buildings.
- C-Rated Ineligible: Built during the historic period but has had major alterations or additions. No longer retains integrity.
- D-Rated Ineligible/Out-of-Period: Built after the historic period.

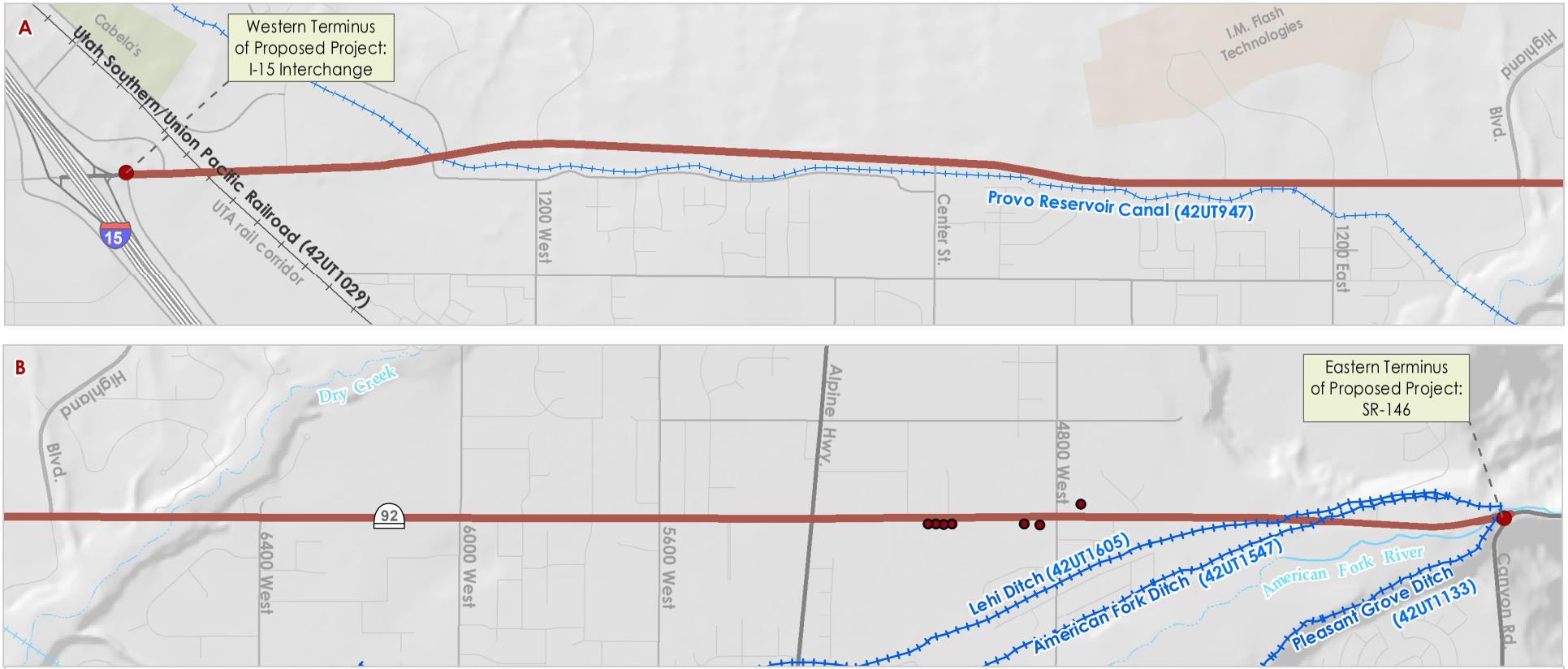
Table 3-39 summarizes the historical buildings identified within the SR-92 APE. The locations of the historic properties are shown in Figure 3-24.

Table 3-39: Historic Buildings

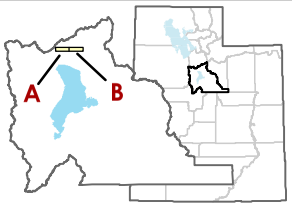
Address	Approximate Date Built	Description	Eligibility (NRHP and SHPO)
5615 W. 11000 N.	1920	Bungalow residence; exhibits elements of Bungalow style; clad in aluminum siding and regular brick; alterations are substantial and include out-of-period enclosure of the eastern half of the porch, modification of the exterior treatment, replacement of most of the original windows, and out-of-period side/rear and garage additions; one non-contributing outbuilding and one non-contributing concrete silo were visible on the property.	Not Eligible for NRHP SHPO C-Rating
5059 W. 11000 N.	1960	Split-level residence with attached garage; exhibits general Ranch/Rambler style; clad in skintled brick and wood sheet; alterations appear to include the application of a clay tile roof and replacement of the original windows; no outbuildings were visible.	Eligible for the NRHP Under Criterion C SHPO B-Rating

Address	Approximate Date Built	Description	Eligibility (NRHP and SHPO)
5043 W. 11000 N.	1960	Ranch/Rambler residence; exhibits general Ranch/Rambler style; clad in striated brick and vinyl siding; alterations include the construction of a pergola on the primary façade and the application of vinyl siding in the cross-gable; no outbuildings were visible.	Eligible for the NRHP Under Criterion C SHPO B-Rating
5027 W. 11000 N.	1960	Split-level residence with attached garage; exhibits general Ranch/Rambler style; clad in original wide aluminum siding and striated brick; alterations appear to be limited to the replacement of the original windows; no outbuildings were visible.	Eligible for the NRHP Under Criterion C SHPO B-Rating
5011 W. 11000 N.	1960	Ranch/Rambler residence; exhibits a combination of general Ranch/Rambler and late 20th Century other (neo-Arts & Crafts) style; clad in textured brick and wood sheet with a wood shingle roof; alterations appear to be limited to the replacement of some of the original windows; no outbuildings were visible.	Eligible for the NRHP Under Criterion C SHPO B-Rating
4875 W. 11000 N.	1960	Ranch/Rambler residence; exhibits a combination of general Ranch/Rambler and Contemporary style; clad in wood sheet and textured brick; alterations appear to be limited to the replacement of the original roofing material with standing-seam metal roofing; no outbuildings were visible.	Eligible for the NRHP Under Criterion C SHPO B-Rating
4851 W. 11000 N.	1960	Ranch/Rambler residence; exhibits a combination of general Ranch/Rambler and Contemporary style; clad in stone veneer and textured brick; no notable alterations; no outbuildings were visible.	Eligible for the NRHP Under Criterion C SHPO A-Rating
4774 W. 11000 N.	1955	Ranch/Rambler residence; exhibits elements of general Ranch/Rambler style; regular brick and stucco; alterations appear to be limited to the application of stucco to the breezeway of the primary façade and possible minor modification of the window wall in the primary façade; one contributing outbuilding, a detached garage, was visible.	Eligible for the NRHP Under Criterion C SHPO B-Rating
4361 W. 11000 N.	1920	Cross-wing residence; exhibits elements of general Victorian and late 20th Century style; clad in aluminum and vinyl siding; heavily modified with side, rear, and roof additions, replacement of original windows, and alteration of fenestration and exterior treatment; six non-contributing outbuildings were visible.	Not Eligible for the NRHP SHPO C-Rating

For most historical buildings along the project corridor, the historic boundary for the consideration of impacts roughly equates to the legal parcel boundary. For all NRHP-eligible properties documented along SR-92, the boundary for assessing impacts begins behind the existing public sidewalk and encompasses the remainder of the legal tax parcel associated with the historical building.



Sources: Utah AGRC



Project Area Context

SR-92 Project | Freeway | Hwy. Entrance | US Route | State Road | Local Arterial | Residential St. | Railroads | Canal | Tunnel | Intermt. Stream | Perenn. Stream

Historic Canal
Historic Residential Site
Historic Railroad

Figure 3-24
Historic Resources

0 0.25 0.5 Mile

SR-92: Lehi - Highland
Environmental Assessment

Determination of Eligibility

A determination of eligibility (DOE) has been prepared by FHWA and UDOT. The purpose of the DOE is to document the findings of the cultural resources inventory technical report and to have SHPO concur with these findings. The DOE for this project was signed by SHPO on August 1, 2007; a copy is included in Appendix C.

Paleontological Resources

After consulting with UGS and reviewing relevant paleontological literature, no paleontological localities have been previously documented in the study area; see related correspondence in Appendix A. Also, no paleontological resources were identified during field inspections for the project. The potential for such resources to be present is low.

Impacts

The impacts to historic properties are assessed according to categories established in NHPA's implementing regulations (36 CFR 800.5). These categories include *no historic properties effected* or *no effect*; *no adverse effect*; and *adverse effect*. No paleontological resources are known to be present in the areas that could be impacted by the alternatives. As such, only those impacts that could affect archaeological or architectural resources are discussed.

No-Build Alternative

The No-Build Alternative would not impact any historic or archeological resources within the study area.

Preferred Alternative

NRHP-eligible archaeological sites and historic buildings that are impacted by the Preferred Alternative are those that have either a finding of no adverse effect—for example, a small strip of land—or adverse effect—for example, complete parcel acquisition or proximity damages. A property with a finding of no historic properties affected, also known as no effect, is not impacted by the project. Table 3-40 summarizes the anticipated effects of the Preferred Alternative on the NRHP-eligible archaeological sites and historic buildings within the SR-92 APE.

Finding of Effect

The types of impacts—no historic properties effected, no adverse effect, or adverse effect—are determined by FHWA and UDOT followed by concurrence from SHPO. These determinations are made only for those buildings and sites that are considered to be eligible for the NRHP; please refer to Tables 3-34 and 3-35 for more detail. The findings of effect for the NRHP-eligible resources along the project corridor are documented in a finding of effect (FOE). The FOE for this project was submitted August 13, 2008, and SHPO concurred on August 27, 2008; a copy of the FOE can be found in Appendix C.

Table 3-40: Archaeological Sites and Historic Buildings

Archaeological Site No./Historic Property Address	NRHP Type of Effect (or Impact)	Comments
Archaeological Sites		
42UT947, Provo Reservoir Canal (also known as Murdock Canal	No Adverse Effect	Existing culvert crossing at SR-92 would be replaced with a new culvert, approximately 416 feet longer. The canal would pass under SR-92 in a siphon. The existing culvert crossing at Center Street would either be replaced or extended by approximately 35 feet. No contributing features would be affected, and visual continuity of the linear resource would not be unduly compromised; the remainder of canal would be avoided.
42UT1029, Utah Southern/Union Pacific Railroad	No Adverse Effect	Rail line would be severed at SR-92, and SR-92 profile would be lowered to accommodate future grade-separated crossing. Until UTA constructs bridge for light rail in the future, line will not be functional. Coordination between UTA and Union Pacific Railroad is ongoing. Remainder of railroad would be avoided.
42UT1133, Pleasant Grove Ditch	No Adverse Effect	Existing culvert at SR-92 would be replaced with a new culvert, approximately 190 feet longer; no historical features would be affected and remainder of ditch would be avoided.
42UT1547, American Fork Ditch	No Adverse Effect	Approximately 968 feet of the ditch parallel to SR-92 on the north side would be placed in a pipe. Existing culvert at SR-92 would be replaced with a new culvert, approximately 254 feet longer. No contributing features would be affected, and visual continuity of the linear resource would not be unduly compromised.
42UT1605, Lehi Ditch	No Adverse Effect	Approximately 345 feet of the eastern branch of the ditch (Upper South Club Branch) would be piped immediately adjacent to SR-92. The existing culverts under SR-92 and an access road north of SR-92 would be replaced and extended by a total a roughly 290 feet. Approximately 449 feet of the western branch (Main Branch) immediately north and south of SR-92 would be piped, and the existing culvert under SR-92 would be replaced with a new culvert approximately 98 feet longer. No contributing features would be affected along either canal branch, and visual continuity of the linear resource would not be unduly compromised.

Archaeological Site No./Historic Property Address	NRHP Type of Effect (or Impact)	Comments
Historical Buildings		
5059 W. 11000 N.	No Adverse Effect	Strip take and partial right-of-way acquisition (approximately 1,160 square feet) would take place; an 8-foot easement across frontage of the property would be acquired; an 8-foot easement for utilities may be needed; a larger temporary easement would be needed in the driveway; alignment would avoid house and contributing features.
5043 W. 11000 N.	No Adverse Effect	Strip take and partial right-of-way acquisition would take place; an 8-foot easement across frontage of the property would be acquired; an 8-foot easement for utilities may be needed; a larger temporary easement would be needed in the driveway; alignment would avoid house and contributing features.
5027 W. 11000 N.	No Adverse Effect	Strip take and partial right-of-way acquisition would take place; an 8-foot easement across frontage of the property and an 8-foot easement for utilities may be needed; a temporary easement would be needed in the driveway area; alignment would avoid house and contributing features.
5011 W. 11000 N.	No Adverse Effect	Strip take and partial right-of-way acquisition for an 8-foot easement across frontage of the property would take place; a temporary easement would be needed in the driveway area; alignment would avoid house and contributing features.
4875 W. 11000 N.	No Adverse Effect	Strip take and partial right-of-way acquisition (approximately 580 square feet) would take place; additionally, an 8-foot easement across frontage of the property would be acquired, and 8-foot easement for utilities may be needed; a temporary easement would be needed in the driveway area; alignment would avoid house and contributing features.
4851 W. 11000 N.	No Adverse Effect	Strip take and partial right-of-way acquisition (approximately 730 square feet) would take place; additionally, an 8-foot easement across frontage of the property and 8-foot easement for utilities may be needed; a temporary easement would be needed in the driveway area; alignment would avoid house and contributing features.
4774 W. 11000 N.	No Adverse Effect	Strip take and partial right-of-way acquisition (approximately 1580 square feet) would take place; additionally, a 10-foot easement across frontage of the property and an 8-foot easement for utilities may be needed; a temporary easement would be needed in the driveway area; alignment would avoid house and contributing features.

Mitigation

Efforts to avoid or minimize impacts to historic properties were incorporated into the Preferred Alternative. As a result of the avoidance and minimization measures incorporated into the design, all historic properties present along the project corridor would either not be impacted or would be subject to limited impacts, which warrant a finding of no adverse effect under the NHPA Section 106 process. As such, no mitigation other than the avoidance and minimization measures is necessary. A detailed list of the historic homes and features in the area and the limited impacts that have been preliminarily approved are listed in Table 3-40 and in Chapter 4. In addition the contractor will comply with SHPO's final FOE for this project, which is included in Appendix C.

The following design measures were applied independently or in combination to minimize impacts to historic homes:

- Widening the roadway to the north
- Reducing the park strip width from 4.5 feet to 3.5 feet
- Reducing the median turn lane from 14 feet to 12 feet
- Reducing lane widths from 12 feet to 11 feet

Other design measures can be considered provided that impacts are not increased.

Questar has discussed the possibility for gas line improvements in the Highland area in the vicinity of the historic homes. Easements have been identified in this document for utilities. If Questar's improvements go outside the designated easements, they are responsible for their own environmental clearances.

Implementing the Preferred Alternative could potentially result in the discovery of previously unidentified, subsurface cultural resources. For this reason, UDOT's Standard Specification 01355 Environmental Protection applies to the SR-92 project.

3.16 HAZARDOUS WASTE

Regulatory Setting

Hazardous waste sites were assessed in accordance with the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and the UAC Title 19 Environmental Quality Code. To protect the health of the public and the environment, DEQ's Division of Emergency Remediation and Response (DERR) oversees the use of hazardous waste in accordance with state and federal regulations.

Affected Environment

A hazardous materials assessment was conducted for the study area. The assessment included database reviews from the Environmental Data Resources, Inc. (EDR) and DERR as well as a field reconnaissance to confirm the database information.

The database reports identified six regulated sites within one-half mile of the project corridor that have the potential to use and/or release hazardous or controlled substances. The following table lists the facilities that were identified in the database search and their relative potential for impact.

Table 3-41: Hazardous Waste Sites

No.	Facility/ Property Name	Location	Distance and Direction from SR-92 Center Line	Relative Groundwater Gradient (Flow Direction) to Study Area	Database	Relative Potential to Impact Road Right-of-Way
1	IM Flash Technologies, Inc.	1550 E. 3400 N.	2,163 Feet North	Upgradient	FINDS RCRA-SQG	Low
2	Kountry Korner	5260 W. 11000 N.	Adjacent to SR-92	Crossgradient	UST, LUST, FINDS	Moderate
3	Saratoga West Crops Project	10770 N. 8000 W.	1,934 Feet South	Crossgradient	UST, LUST	Low
4	Alpine Country Club	4980 Country Club Dr.	1,160 Feet South	Up to Crossgradient	UST, LUST	Low
5	Sunmart 871	3295 N. Thanks-giving Way	698 Feet West-SW of West End of SR-92	Downgradient	UST, LUST	Low
6	Westroc	4600 W. 11200 N.	340 Feet North	Upgradient	AST	Low

FINDS: The facility index system contains both facility information and pointers to other sources of information that contain more detail.
UST: The underground storage tank (UST) database contains a listing of the facility, owner, location, and tanks not closed or removed.
LUST: The leaking underground storage tank (LUST) database contains an inventory of reported LUST locations and indicates whether or not a site is closed, which would require no further cleanup action.
AST: The above-ground storage tank (AST) database contains a listing of ASTs.
RCRA-SQG: The RCRA's small quantity generator database includes information on sites that generate, transport, store, treat, and/or dispose of small quantities of hazardous waste.

Impacts

No-Build Alternative

The No-Build Alternative would not impact the hazardous material sites identified in the study area.

Preferred Alternative

Only one of the six identified hazardous materials sites, the Kountry Korners gasoline station, may impact the project. The Kountry Korners gasoline station is adjacent to the roadway and has a reported history of petroleum releases. The station currently contains two 12,000-gallon gasoline underground storage tanks (USTs), one 8,000-gallon gasoline UST, and one 7,000-gallon diesel fuel UST. Petroleum could be present in Kountry Korner's soil from previous and/or currently undetected fuel releases. It is possible that petroleum-impacted soil could be encountered in this area during roadway construction.

Mitigation

If petroleum hydrocarbons or other previously unidentified hazardous materials are encountered during construction, appropriate characterization and handling of the soil/waste will be required. During construction, the contractor will be required to comply with UDOT Standard Specification 01355 Environmental Protection. This specification provides guidance to follow in the event that hazardous materials are discovered or generated during construction activities.

3.17 VISUAL QUALITY

Regulatory Setting

There are no specific state or federal regulations pertaining to visual impacts from transportation projects. The FHWA Technical Advisory (T6640.8A) provides guidance for identifying the impacts to existing visual resources as well as measures to avoid, minimize, or reduce any adverse impacts (FHWA 1987).

Affected Environment

The study area for this analysis includes the viewshed around the existing SR-92 corridor, extending from I-15 to SR-146 at American Fork Canyon. For the purpose of this analysis, the viewshed includes those areas from which physical changes associated with the Preferred Alternative could be seen. The viewshed varies on perspective or location. It is also influenced by surrounding topography, natural resources, and structures.

A visual analysis from SR-92 and the surrounding area quickly reveals that the views of the surrounding mountains, Utah Valley, and Utah Lake are prominent features within the SR-92 viewshed. Additional visual features identified include trees and other types of vegetation located in Highland City. Several water resources can also be seen from the SR-92 viewshed.

Situated on the benches of Mount Timpanogos, the study area gradually gains elevation as SR-92 heads east. From the study area, the view is defined by the 11,742-foot Mount Timpanogos and Wasatch Mountains to the east, as shown on Figure 3-25. To the south and west, the views include Utah Valley, Utah Lake, and the southern end of the Oquirrh Mountains. Immediately to the north, the views are generally dominated by Traverse Mountain and its associated development, Dry Creek, as well as a ridgeline development further east.

Figure 3-25: View of the Wasatch Mountains from Dry Creek, Facing East

This area, once rural and dominated by agricultural uses, has grown into a semi-urban region in Utah County. The area surrounding SR-92 is primarily comprised of residential, commercial, and industrial land uses, as described further in Section 3.1. Trees and other vegetation located along

the existing SR-92 corridor in Highland reduce the visual impacts of residential and commercial development and are an important aesthetic and natural amenity to the viewshed. Figure 3-26 illustrates the way in which trees are a visual resource along the project corridor.

Figure 3-26: View of Trees on the North Side of SR-92 from the Intersection of 5730 West

Water resources identified as visual features within the SR-92 viewshed include the American Fork River, Dry Creek and Provo Reservoir Canal. The American Fork River originates from within the Lone Peak Wilderness of the Wasatch Mountains and enters the study area near the mouth of the American Fork Canyon; see Section 3.9 for more detail. The river flows underneath the intersection of SR-146, buffering the Cedar Hills Golf Course from SR-92. The river fans into a debris and boulder field where signs of erosion prevention are visible, as shown on Figure 3-27. Concrete barriers and fill slopes have degraded the natural value of this resource and, in turn, much of its visual appeal.

Figure 3-27: View of American Fork River from Below SR-146, Facing West

Dry Creek originates from the Traverse Mountains and the Wasatch Mountains approximately four miles to the north and east of the study area. As the creek meanders into the study area, its visual appeal is aided by the appearance of a natural riparian environment. It crosses under SR-92 where the channel flows through a boulder field before exiting the study area.

The Provo Reservoir Canal is a prominent visual feature within the study area. The canal parallels SR-92 in the western half of the study area. The canal is a man-made feature and lacks the characteristics of a natural riparian environment. However, the canal is an important connection to the history of the area and is a reminder of the prominent role that agriculture once played in this region. For more information on the canal, see Section 3.15.

Impacts

No-Build Alternative

Under the No-Build Alternative, congestion will increase more than in the Preferred Alternative. The east-west viewsheds toward the American Fork Canyon or Utah Lake will likely be impacted by the increased congestion along SR-92.

Preferred Alternative

The Preferred Alternative would contain various structural features—including increased pavement, cut and fill slopes, and overpasses—that would have minimal impacts to the visual resources identified along the SR-92 viewshed.

The Preferred Alternative would increase the pavement for additional lanes, intersections, new access points, and bridges. However, increased pavement would not substantially alter the existing visual character of the area.

Due to the geography of the study area, the Preferred Alternative would require cut and fill slopes and would require the use of walls in certain locations. Views from these vantage points are already impacted from existing SR-92; however, the Preferred Alternative would further limit

the views from residential and commercial properties from north to south as well as for those traveling along Bull River Road, which parallels existing SR-92.

The addition of the express lanes would create the need for grade separations in the following proposed intersections:

- I-15
- Frontage Road Prior to Merging with I-15
- Triumph Boulevard
- 1200 West
- Center Street
- 1200 East
- IM Flash Technologies Entrance
- Highland Boulevard

The overpasses would be approximately 25 feet tall at their center point, limiting north/south views from either side of the expressway. Those traveling east/west on the expressway itself would have improved panoramic views of the surrounding valley as well as the Wasatch Mountains to the east.

Figure 3-28: View of SR-92 from Bull River Road, Facing Northwest

Although vegetation is sparse throughout much of the corridor, trees are found throughout the study area in Highland City. Based on aerial photography taken in April of 2007, approximately 290 trees would be removed under the Preferred Alternative, degrading the visual benefits that trees offer to residences and to those traveling along the project corridor.

Temporary visual impacts are standard in construction zones. Impacts may include staging areas, disturbed vegetation and soils, fencing, stock pile sites, dust, and lighting as needed. Cranes and other necessary construction machinery may also impact views of the surrounding viewshed.

Mitigation

Mitigation measures will include protecting existing vegetation and trees as possible. These measures will include preventing disturbance beyond construction limits, stabilizing and revegetating slopes in accordance with UDOT standards, and rounding slopes to blend new cuts into the existing grade.

Incorporating UDOT's context sensitive solutions (CSS) into the design phase of this process will help minimize visual impacts. This will be done through close coordination local entities, as defined by UDOT during the design phase, on design preferences and aesthetic treatments within the budget for the project. Efforts will include revegetating the corridor; incorporating Highland City's Parkway Detail into the design, color, and texture of walls along the corridor; and using appropriate lighting.

3.18 CUMULATIVE IMPACTS

Regulatory Setting

CEQ regulations—40 CFR 1500 to 1508—require an assessment of cumulative impacts. These regulations ensure that the proposed SR-92 project and other federal, state, and private actions will be evaluated with regard to cumulative effects. The CEQ regulations found in 40 CFR 1508.7 define cumulative effects as follows:

> The impact on the environment [that] results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Cumulative Impacts Analysis

The cumulative impact analysis considered the impacts that the SR-92 project would have on surrounding resources. It also considered if these resources have been, are currently being, or will be impacted by other actions. Agency scoping and public comments received during scoping were considered as well.

Important Cumulative Impacts Issues

Based on the scoping and impact analysis completed for each resource, three resources were identified for the cumulative impact analysis:

- Air quality
- Water quality
- Farmland

To fully consider past, present, and reasonably foreseeable future actions, the geographic area and timeframes analyzed for each resource are below:

- Farmland: Both Utah County and communities immediately adjacent to the SR-92 corridor, 1850 to 2030
- Air quality: Utah County, 1975 to 2030
- Water quality: The Jordan River and Utah Lake Watershed Units, 1970 to 2030

Past Actions

Although the SR-92 study area is located in the northern portion of Utah County, the entire county was considered when looking at past actions; this was done to better understand the development of the study area. Utah County has experienced major urbanization, resulting in residential, commercial, and industrial developments. It has also experienced the conversion of farmland to other uses.

Rapid population expansion began in 1850 with the establishment of several new settlements in Utah Valley: Alpine, American Fork, Lehi, Payson, Pleasant Grove, and Springville (Holzapfel 1999). According to the 1850 census, Utah County had a population of approximately 2,000 people. With continued urban expansion, the population has grown dramatically. In 2007, the population was approximately 501,447 (Knowlton 2008). This growth has caused a loss of farmlands and wildlife habitat and a degradation of air and water quality. The aggregate environmental effects of past actions in the study area are reflected in the current affected environment, as described in each section of this chapter.

Present and Reasonable Foreseeable Actions

Present and reasonably foreseeable future actions include ongoing development activities and transportation projects. Table 3-42 describes the recent or reasonably foreseeable projects that have or will affect the study area's farmland, air quality, and water quality, regardless of implementing the Preferred Alternative.

Table 3-42: Present and Reasonably Foreseeable Transportation Actions

Project or Activity	Description	Impacts	Project Status
Proposed Commuter Rail Alignment	Evaluation of commuter rail in Salt Lake and Utah Counties	Analysis in process; no data available.	Under Construction
Mountain View Corridor	Create new highway and transit corridors in Salt Lake and Utah Counties	• Farmland—1,500 acres or less impacted • Air Quality—Conforms to state implementation plan (both Salt Lake and Utah Counties) • Water Quality—Increase in impervious surface could reduce water quality	Planning

Project or Activity	Description	Impacts	Project Status
Pioneer Crossing	Build new road north of Utah Lake from Redwood Road to I-15	Analysis in process; the following impacts are estimates: • Farmland—20 to 70 acres impacted • Air Quality—Conforms to state implementation plan • Water Quality—Increase in impervious surface could reduce water quality	Planning
I-15 Corridor (Utah County)	Capacity and safety improvements to I-15 in Salt Lake and Utah Counties. Roadway improvements are planned from 12300 South in Salt Lake County to the South Payson interchange	Analysis in process; the following impacts are estimates: • Farmland—490 to 530 acres impacted • Air Quality—Conforms to state implementation plan • Water Quality—Increase in impervious surface could reduce water quality	Planning
SR-68	Five-lane corridor with at-grade crossing at Union Pacific Railroad/Commuter Rail intersection at 500 South. Have 94 to 110 feet right-of-way. Create continuous shoulders, sidewalks, and curb and gutter. Create a corridor with improved mobility, drainage, and roadway geometrics that also meets current federal and state roadway design standards.	• Farmland—20 acres impacted • Air Quality—Conforms to the state implementation plan • Water Quality—No impairment of the Jordan River or its tributaries	Under Construction
Alpine Highway—SR-92 to Canyon Crest Road	Widen to four lanes, add bike lanes	N/A	N/A

Project or Activity	Description	Impacts	Project Status
Alpine Highway—SR-92 to American Fork Main	Widen to four 12-foot lanes and add a 14-foot median and 8-foot shoulders for approximately 1 ¼ miles. The median is continuous. Another 12-foot lane will be added to the southbound off-ramp. The lane will be added toward the interstate. Near the bottom or at the end of the ramp at SR-92, a third lane will be added.	• Farmland—5 acres impacted • Air Quality—The project adds or alters roadway capacity and may result in increased traffic volumes • Water Quality—Increase in impervious surface could reduce water quality	Planning
Geneva Road	Widen Existing Geneva Road from 800 North in Orem to Center Street	• Farmland—0 to 20 acres • Air Quality—Air Quality Conforms to the state implementation plan • Water Quality—Increase in impervious surface could reduce water quality	Planning
Vineyard Connector	The study area includes the area east of Utah Lake and west of I-15; from about Center Street in Orem on the south to the I-15 interchange at American Fork Main Street on the north. The study area includes the cities of American Fork, Lindon, Vineyard, and Orem.	Analysis in Process	Planning—Alternatives Developed
State Street	Improve intersections and widen State Street from 200 North in Orem to 100 East in American Fork.	Analysis in Process	Planning
Airport Road	Build new road from I-15 to Provo Airport or Center Street.	Analysis in Process	Planning

Project or Activity	Description	Impacts	Project Status
Provo Reservoir Canal Trail	Open space/ pedestrian trail corridor, 10-foot asphalt trail. Assumed crossing on reconfigured SR-92 overpass crossing.	N/A	Planning

As discussed in Section 3.1, the area is developing quickly and has growing traditional urban/suburban land uses and infrastructure. This transformation has created a loss of open space, farmland, wildlife habitat, and wetlands. Associated impacts include air pollutant emissions, stormwater runoff, and noise. See Tables 3-43 and 3-44 for a list of major development occurring adjacent to the study area and for the number of housing units permitted from 2005 to the first quarter of 2007 in the study area.

Table 3-43: Major Developments in the Permitting Process or Under Construction

Developments	Number of Housing Units
Suncrest (Draper, Salt Lake County)	3,888 Housing Units
Traverse Mountain, Lehi	8,000 Housing Units
Frank Gehry/Anderson Development, Lehi	2,500 Housing Units
Thanksgiving Meadows, Lehi	327 Housing Units
Thanksgiving Point, Lehi	328 Housing Units

Table 3-44: Units Permitted from 2005 to First Quarter of 2007

Community	Number of Housing Units
Lehi	5,266 Housing Units
Alpine	334 Housing Units
American Fork	1,896 Housing Units
Highland	521 Housing Units
Pleasant Grove	2,040 Housing Units

Cumulative Impacts

This section discusses the cumulative impacts associated with each resource that may be affected by the Preferred Alternative and by past, present, and future actions.

Farmlands

Based on the best available data for past and future trends, the geographic scope includes both Utah County in its entirety, and those communities within or adjacent to the SR-92 study area. Currently, only three percent of the total land area within Utah County is agricultural.

No farmland data is available between 1850 and 1960. However, Utah County was primarily an agricultural-based economy for many years. As populations grew, the eastern benches of Utah County experienced the most development pressure. According to the Utah Division of Water Resources' land survey, irrigated croplands totaled approximately 172,000 acres in 1966, and by 1995, that total had increased to 174,000 acres (UDOT 2008). By 1995, irrigated lands in Utah County totaled approximately 99,289 acres (Utah GIS Portal). The 2002 Division of Water Resources' land survey cites a decline in the amount of land available for agriculture in Utah County; it has been reduced from 211,259 acres in 1995 to 168,376 acres in 2002 (UDOT 2008).

No data is available on the conversion of farmland by 2030. However, a comparison of the Governor's Office of Planning and Budget's (GOPB's) *Greater Wasatch Area Developed Land 2003* to the *Greater Wasatch Area Developed Land 2006* indicates that development in northern Utah County and Utah County as a whole will result in a significant loss of farmland. Based on general plan data for the cities above, agricultural land will be developed in the coming years.

The SR-92 Preferred Alternative would impact approximately five acres of farmland, as discussed in Section 3.2. Other transportation projects listed in Table 3-42 above would result in approximately 2,125 additional impacted acres of agricultural land. However, the main contributor to the future conversion of farmland is the rapid urbanization of the region by commercial, residential, or industrial development. Although there is no data available on the exact conversion of farmland in 2030, estimates have been made based on the current and future trends. It is expected that those communities in northern Utah County will continue to experience a conversion of farmland to urban uses with or without the completion of the Preferred Alternative. Therefore, it is likely that the Preferred Alternative would not result in substantive cumulative impacts to farmlands.

Air Quality

The CAA requires EPA to set NAAQS for wide-spread pollutants. The pollutants originate from numerous and diverse sources that are considered harmful to public health and the environment. (EPA 2008).

County boundaries are the regulatory boundaries most often used to discuss air quality. For the purposes of this section, the geographic scope is Utah County (Hardy 2008). The total timeframe for this analysis is approximately 1976 to 2007, based on available data. The data is provided by Utah DAQ's 2007 annual report.

Despite rapid growth and development, air quality in Utah has improved in the past 25 years due to more rigorous guidelines for vehicle emissions and industry. During the 1980s, the health standards for four of the six criteria pollutants identified by EPA were violated by one or more of Utah's counties. Those pollutants included the following:

- Carbon Monoxide
- Ozone
- Particulate Matter
- Sulfur Dioxide

Figures 3-29 through 3-33 show the historic trends for five of the six criteria pollutants along the Wasatch Front. Lead is omitted from the charts because leaded gasoline was phased-out by the end of 1995, causing lead to no longer be a significant problem (DAQ 2008).

Figure 3-29: Nitrogen Annual Averages

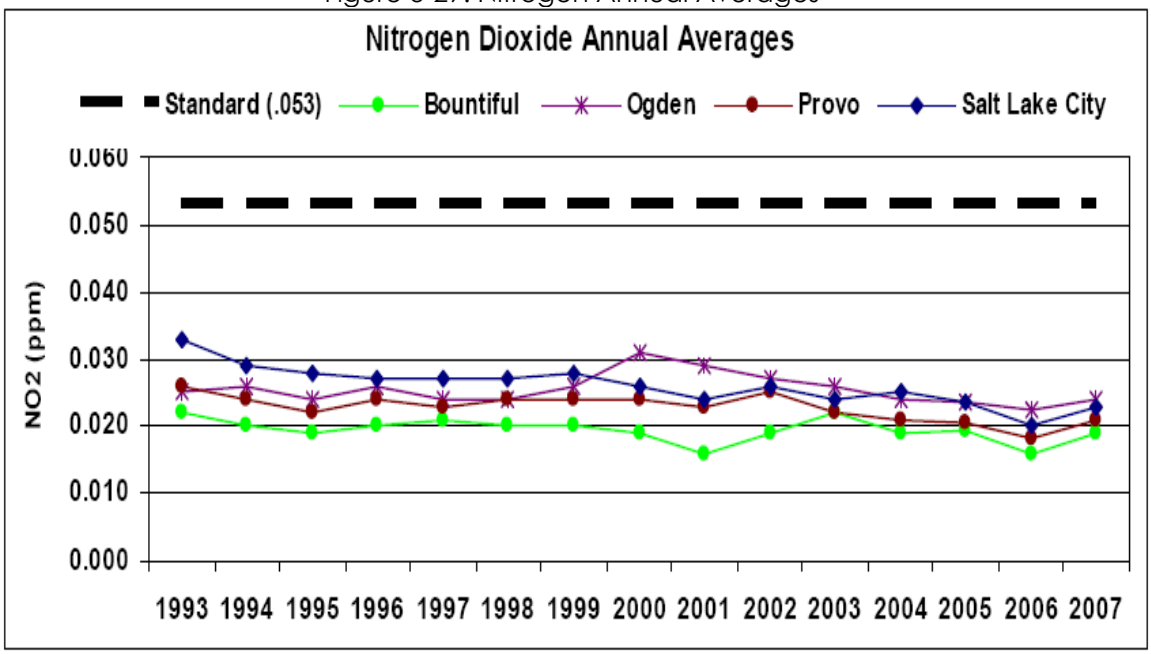


Figure 3-30: Three-Year Average, Eight-Hour Ozone Concentration

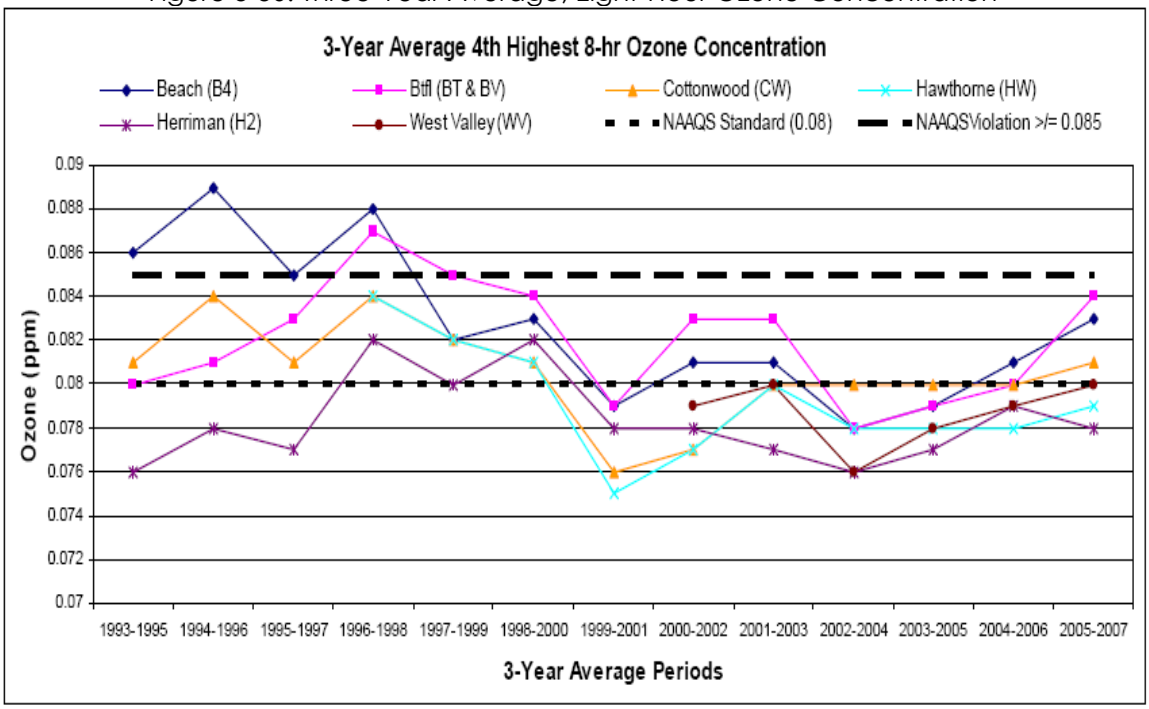


Figure 3-31: PM_{10} Highest 24-Hour Concentration

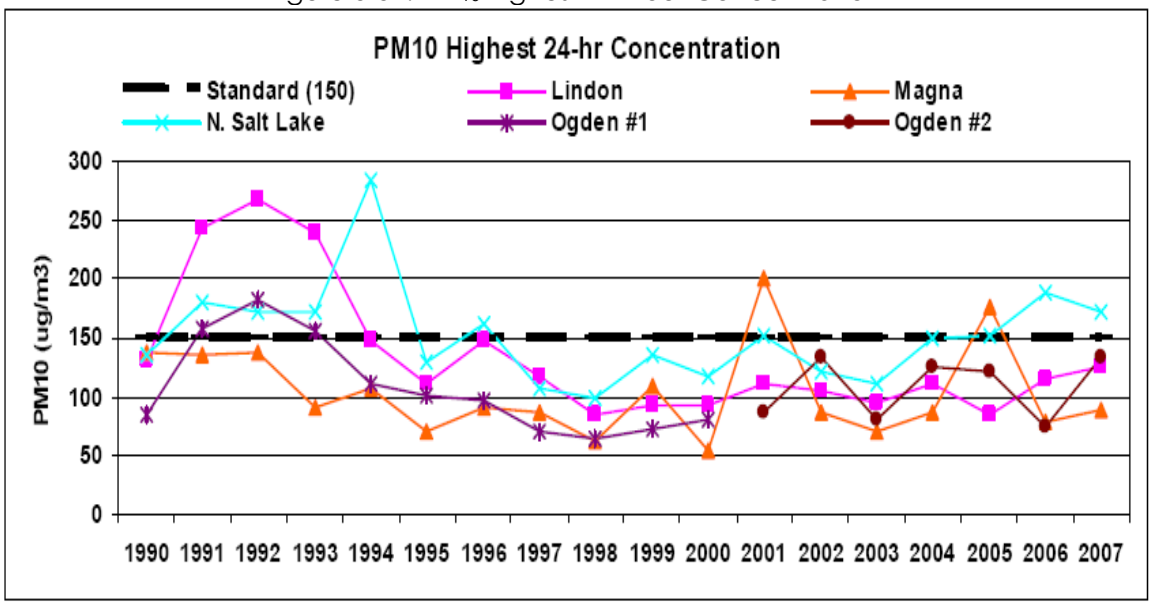


Figure 3-32: $PM_{2.5}$ Three-Year Average of 98th Percentile of 24-Hour Concentration

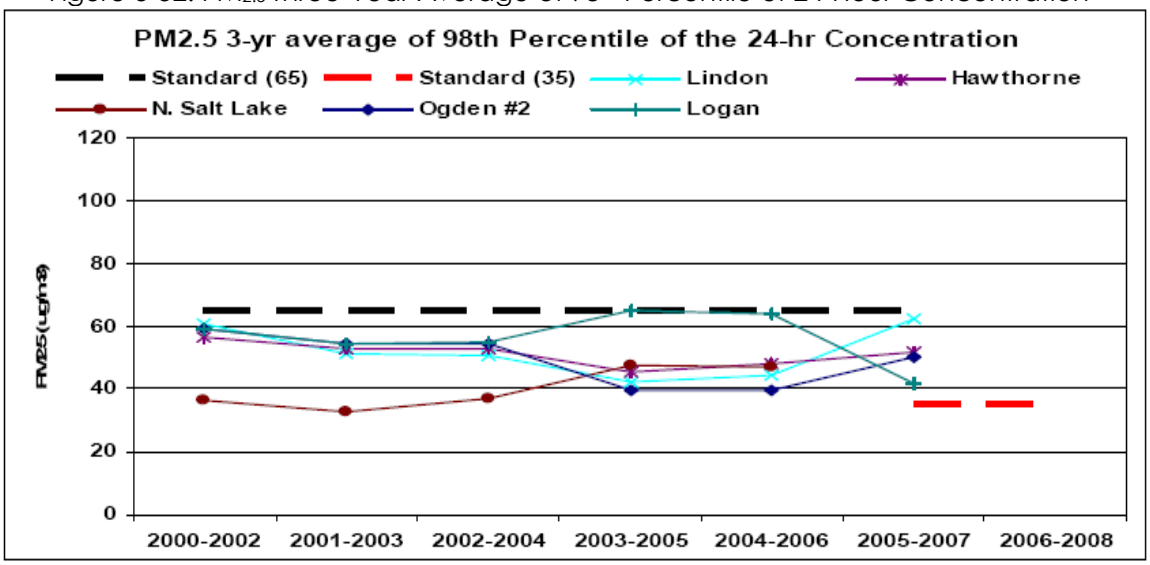
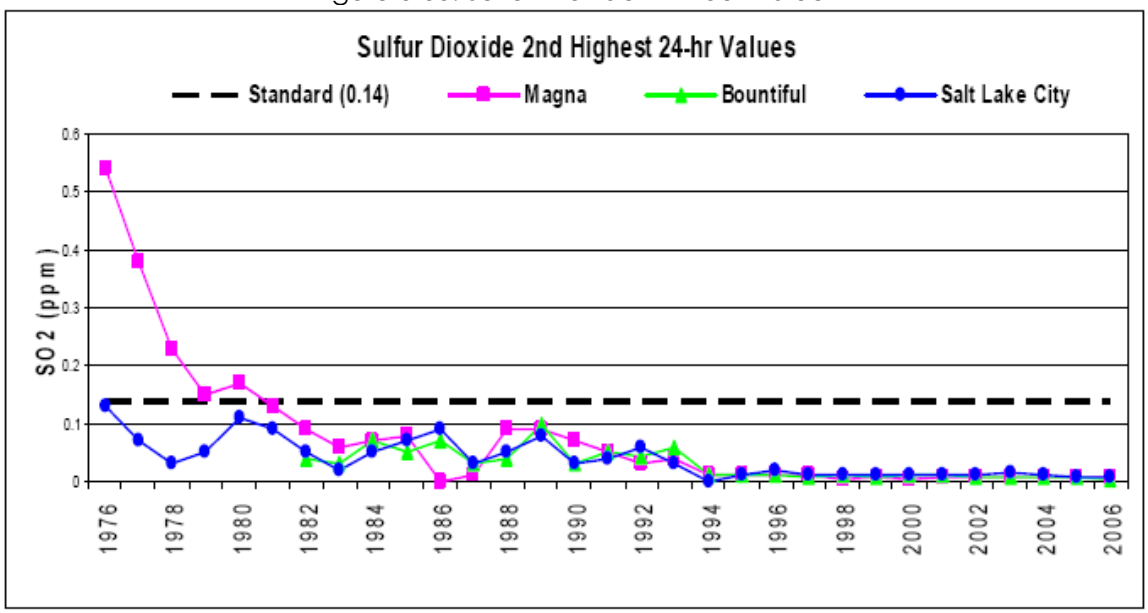


Figure 3-33: Sulfur Dioxide 24-Hour Value



As of December 2006, all of Utah's counties attained current federal air quality standards.

Specifically, Utah County has had trouble meeting the NAAQS in the past. In 1990, EPA designated Utah County as a non-attainment area for CO and PM_{10}. In 2006, EPA redesignated Utah County as an attainment area for CO; however, a redesignation is currently pending for PM_{10}.

On March 29, 2007, EPA issued a rule defining requirements for state plans. These regulations require states to clean the air in areas with levels of fine particle pollution—specifically, $PM_{2.5}$—that do not meet national air quality standards. It is anticipated that portions of Salt Lake and Utah Counties will be designated as non-attainment areas under the revised $PM_{2.5}$ (35 micrograms per cubic meter) standard. Non-attainment designations under the revised standard will be in place by the end of 2009, and conformity to the new standard will be required in 2011 (Izzo).

Rapid growth in Utah County by the 2030 planning period would most likely continue without the SR-92 project. Although a growing population will continue to put pressure on the quality of Utah County's air, continued improvements in technology and vehicle emissions, as well as more stringent air quality laws and requirements, will continue to reduce auto-related emissions.

The model of all projects in MAG's RTP demonstrates that all projects, including SR-92, would be in conformity with NAAQS standards.

Additionally, global climate change and greenhouse gas emissions are a national and regional concern and are being addressed by the federal government in several ways. FHWA is working with other transportation administrations to develop strategies to reduce transportation's contribution to greenhouse gases—specifically CO_2 emissions. In Utah, the Governor's Blue Ribbon Advisory Council on Climate Change (BRAC) identified measures to minimize greenhouse gas emissions including encouraging the use of mass transit, carpooling, telecommuting, the use of alternative fuels, and idle reduction programs for school buses and heavy duty trucks.

Water Quality

The geographic area for this section includes Jordan River and Utah Lake Watershed Management Unit. This area includes streams that drain into Utah Lake, the Jordan River, and the Jordan River's tributaries; see Figure 3-34 for more detail. The timeframe of this analysis is approximately 1975 through 2030. The mid-70s were selected based on available data. The baseline of 2007 was selected based on current water quality data.

Figure 3-34: Jordan River and Utah Lake Watershed Management Unit

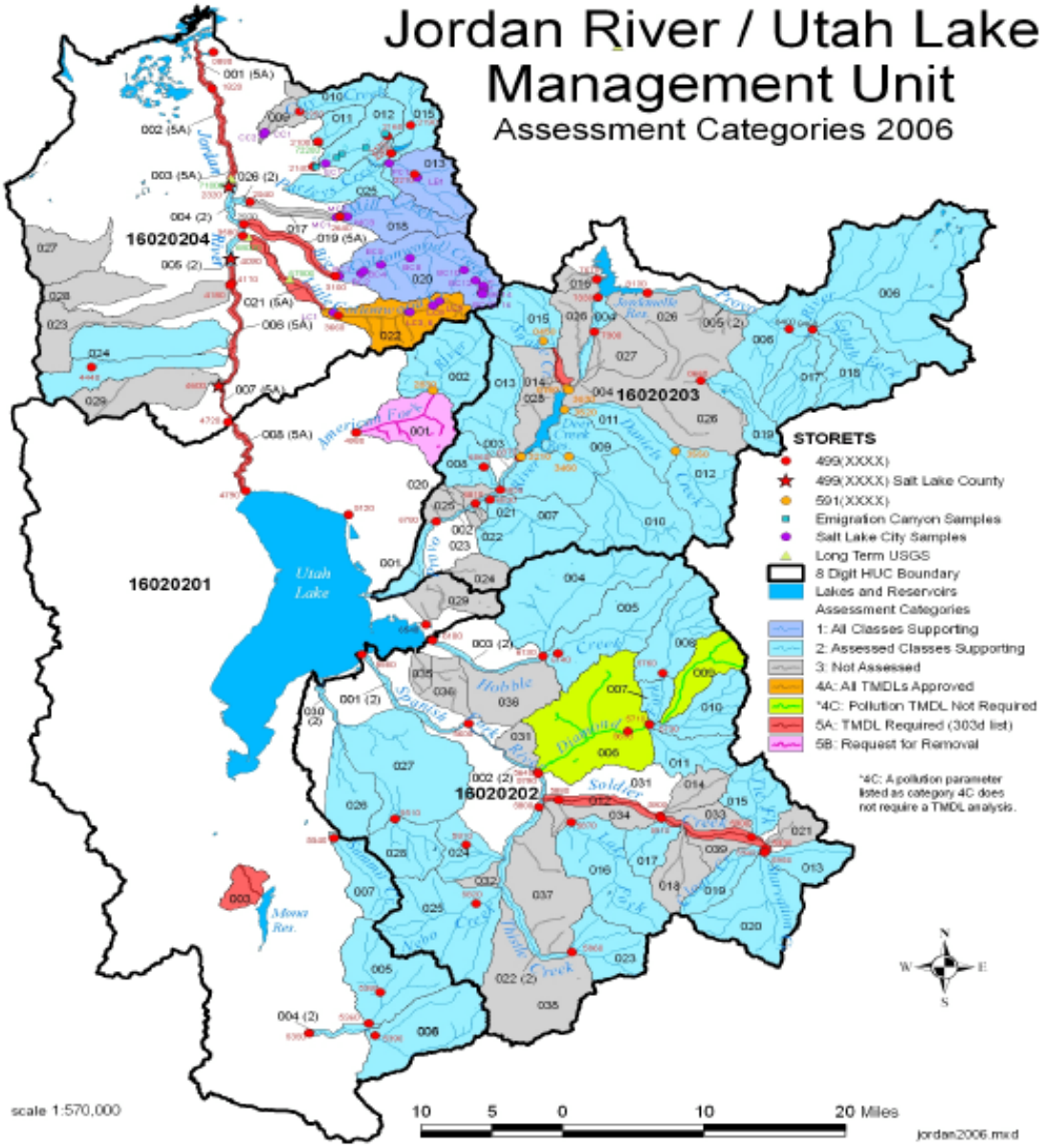


Figure I-5-2. Jordan River beneficial use assessment by categories.

I-5-5

Source: Utah Division of Water Quality 2006

Historic and current human influences on Utah Lake and the watershed include changes to the aquatic biota in the lake, logging and grazing in the watershed, agricultural and stormwater runoff, industrial and municipal discharges, increases in paved surfaces throughout the watershed, and the diversion of natural inflows to the lake (DWQ 2007). Table 3-45 below lists the

sources of water quality impairment for streams in the Jordan River and Utah Lake Watershed Management Unit.

Table 3-45: Sources of Water Quality Impairment in the Jordan River and Utah Lake Watershed Management Unit

Source	Contribution to Impairment
Resource Extraction	19.4%
Unknown	18.1%
Habitat Modification	16.7%
Agricultural	14.7%
Hydromodification	14.7%
Urban Runoff	6.2%
Industrial Point Sources	4.0%
Municipal Point Sources	4.0%
Natural Sources	2.1%
Source: Utah Division of Water Quality 2002	

The Utah Lake-Jordan River Watershed Management Unit Stream Assessment analyzed the decrease in water quality (Utah Division of Water Resources 2002). The report estimated that there are 1,314 perennial stream miles in the Jordan River and Utah Lake Watershed Management Unit, of which 1,025 miles (78.0 percent) were assessed for their designated beneficial uses. Of these miles, 848.5 miles (82.7 percent) were determined to fully support all their beneficial uses; 108.3 miles (10.6 percent) were determined to partially support their beneficial uses; and 68.4 miles (6.7 percent) were determined to not support at least one designated beneficial use. The streams that do not support their beneficial uses are considered impaired.

Regulatory controls, including the CWA (1972) and its revisions (1987), have had beneficial impacts on water quality. Regulations on municipal waste from wastewater treatment plants, stormwater runoff, and industrial discharges have reduced concentrations of pollutants and discharge into the Jordan River (Hooton 1997). In addition, the *Jordan River Water Quality Total Maximum Daily Load Assessment* noted that the water quality of the Jordan River has generally improved since implementing a Section 208 water quality plan written in 1975 (DWQ 2005). However, Utah Lake and Jordan River remain on EPA's 303(d) list of impaired waters.

Presently, urban runoff currently contributes approximately 6.2 percent of the water quality impairment in the Jordan River and Utah Lake Watershed Management Unit; see Table 3-45 for more information. But as development increases, the amount of urban runoff would be likely to increase. The continued urbanization of the watershed could result in the degradation of water quality. However, the amount of agricultural and resource extraction impacts—two of the larger water quality impairments—would be reduced as the region continues to urbanize. Regulatory controls would likely increase in the future as well, reducing water quality impacts further (UDOT 2008).

Currently, stormwater flows along SR-92 into water bodies adjacent to the corridor. Although the Preferred Alternative would increase the impervious surface by approximately 60 acres, it would not change the beneficial use classifications or further impair water bodies in the area, as described Section 3.12.

The regional transportation-related projects listed in Table 3-42 are not expected to increase stormwater runoff or reduce water quality due to controls required to manage and minimize

water quality impacts. Like SR-92, many of these projects are improving conditions by adding control measures that reduce water quality impacts. Therefore, the Preferred Alternative is not expected to result in substantial cumulative impacts to water quality.